KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

RC-76R/RC-78R
Room Controllers

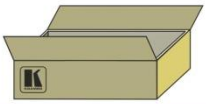
P/N: 2900-300253 Rev 2

RC-76R, RC-78R Quick Start Guide

This guide helps you install and use your **RC-76R**, **RC-78R** for the first time.
To download the latest manual, scan the QR code on the left, or go to:
http://www.kramerelectronics.com/support/product_downloads.asp

Step 1: Check what's in the box

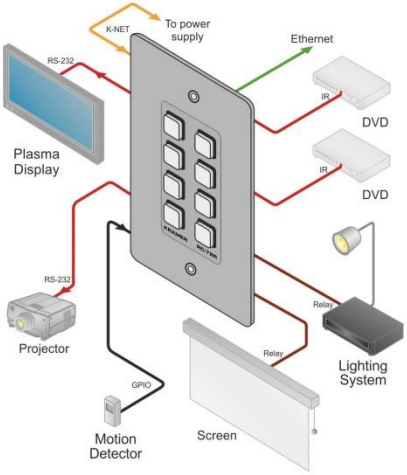
- ☑ **RC-76R** and/or **RC-78R** Room Controller
- ☑ Label Sheets
- ☑ 1 Quick Start sheet
- ☑ 1 12V DC Power supply



Save the original box and packaging materials in case you need to return your **RC-76R, RC-78R** for service.

Step 2: Install the RC-76R, RC-78R

1. Connect the inputs and outputs to their appropriate devices (see the example on the right) using terminal block connectors:
   Inputs: 2 RS-232, 1 RS-485, 1 GPI/O, 1 K-Net, 1 Ethernet (RJ-45)
   Outputs: 2 infrared, 2 relays
   Connect 12V DC power to the unit if power is not available over the K-Net.
2. Mount the unit in the wall.



Step 3: Configure and customize the RC-76R, RC-78R

1. Configure the unit using Kramer **K-Config** configuration software.
   Download the software from the Kramer Web site: http://www.kramerelectronics.com
2. Customize the buttons by inserting the appropriate labels under the button caps.

Step 4: Operate the RC-76R, RC-78R

Operate the unit from a PC running **Site-CTRL** control software.
Download the software from the Kramer Web site: http://www.kramerelectronics.com

Contents

1	**Introduction**	**1**
2	**Getting Started**	**2**
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	3
2.3	Recycling Kramer Products	3
3	**Overview**	**4**
3.1	Defining the RC-76R/RC-78R Room Controllers	5
4	**Connecting the RC-76R/RC-78R**	**7**
4.1	Connecting RS-232 Devices	8
4.2	Connecting RS-485 Devices	8
4.3	Connecting the Ethernet Port	9
4.4	Connecting the K-NET Port	10
4.5	Grounding the RC-76R/RC-78R	10
5	**Operating the RC-76R/RC-78R**	**12**
6	**Front Panel Button Caps and Labels**	**13**
6.1	Installing the Front Panel Button Caps and Labels	16
7	**Technical Specifications**	**18**

Figures

Figure 1: RC-76R/RC-78R Room Controllers 5
Figure 2: Connecting the RC-76R/RC-78R Room Controllers 8
Figure 3: K-NET PINOUT Connection 10
Figure 4: Grounding Connection Components 10
Figure 5: Sample Button Label Sheet 15
Figure 6: Removing the Button Cover Plate Mounting Screws 16
Figure 7: Button Cap Orientation with Label 17
Figure 8: Replacing the Button Cap 17

1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters and GROUP 11: Sierra Products.

Congratulations on purchasing your Kramer **RC-76R/RC-78R** *Room Controllers*, which are ideal for the following typical applications:

- Remote control and management of AV equipment in multimedia rooms, such as classrooms, auditoriums, conference rooms

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables

Go to http://www.kramerelectronics.com to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **RC-76R/RC-78R** away from moisture, excessive sunlight and dust

This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

2.2 Safety Instructions

Caution: There are no operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit

Warning: Disconnect the power and unplug the unit from the wall before installing

2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at *http://www.kramerelectronics.com/support/recycling/*.

3 Overview

The **RC-76R/RC-78R** are highly versatile master room controllers that act as an all-in-one extended remote control panel for control of AV equipment—especially projectors and associated equipment—in any room (such as classrooms, boardrooms, or auditoriums). They streamline operations and simplify control by integrating audio, video, and computer-video sources into a centralized system. The **RC-76R/RC-78R** have identical functionality. The **RC-76R** has six buttons and the **RC-78R** has eight buttons.

The **RC-76R/RC-78R** features:

- 6/8 configurable, RGB backlit, front panel buttons, configured using the **K-Config** configuration software
  Available from Kramer Electronics on our Web site at http://www.kramerelectronics.com/support/?soft=k-config.
- 1 general purpose I/O port that can be configured by **K-Config** as a digital input, digital output or analog input for interfacing with a variety of devices such as sensors, switches, LEDs, or relays
- 2 bidirectional RS-232 ports that can control AV equipment such as projectors, LCD and PDP displays, power amplifiers, switchers and scalers
- 2 relay contact closure ports that can control other room items related to the AV system, such as, raising and lowering drapes, a screen or a projector
- 2 IR control ports with an IR learning receiver behind the front plate that learns commands from any IR remote
- 1 RS-485 control port
- Compatibility with Kramer **Site-CTRL** software for network remote control and management over the Ethernet port
- A **K-NET™** control channel that connects compatible user interfaces, supply power and control data over a single cable
- Flexible control via Ethernet and **K-NET**
- Decora compatible, wall plate size of 1 gang US

3.1 Defining the RC-76R/RC-78R Room Controllers

This section defines the **RC-76R/RC-78R**.

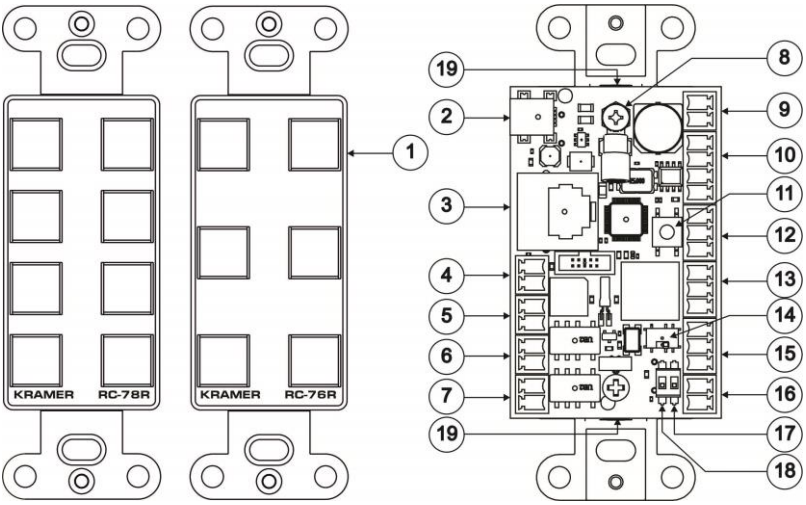


Figure 1: RC-76R/RC-78R Room Controllers

#	Feature	Function
1	6/8 Configurable Buttons	Function is programmed by the K-Config Configuration software
2	USB Connector	Connect to a computer for firmware upgrade or for uploading the configuration file
3	ETHERNET RJ-45 Connector	Connects to the PC or other serial controller through computer LAN to control AV products
4	*IR 2* Terminal Block Connector	Connect to IR emitter cable 2
5	*IR 1* Terminal Block Connector	Connect to IR emitter cable 1
6	*RELAY C2*	Connect to low-voltage relay-driven device 2
7	*RELAY C1*	Connect to low-voltage relay-driven device 1
8	Ring Tongue Terminal Grounding Screw	Connect to grounding wire (optional), (see Section 4.5)
9	Power Supply 2-pin Terminal Block Connector	Connect +12V to +12V, ground to GND
10	K-NET Terminal Block Connector	Connect the GND pin to the Ground connection; pin B (-) and pin A (+) are for RS-485, and the +12V pin is for powering the unit

#	Feature	Function
11	RESET Button	Press to reset to factory default definitions: IP number – 192.168.1.39, Mask – 255.255.0.0, Gateway – 0.0.0.0 First, disconnect the power supply and then connect it again while pressing the Reset button. The unit powers up and loads its memory with the factory default definitions and erases all stored preset
12	*RS-232 (2)* Terminal Block Connector	Connects to a PC or the remote controller
13	*RS-232* (1) Terminal Block Connector	Connects to a PC or the remote controller
14	Program Switch	Slide the switch to the left when programming the unit; slide to the right for normal operation
15	*RS-485* Terminal Block Connector	Pins B (-) and A (+) are for RS-485; Pin G may be connected to the shield (if required)
16	GPIO/GND Terminal Block Connector	Connect to various sensors, switches, LEDs, or relays
17	RS-485 Terminator Switch	Slide the DIP-switch up to terminate the RS-485 line with a 120Ω load; down is for no termination
18	K-Net Terminator Switch	Slide the DIP-switch up to terminate the K-Net line with a 120Ω load; down is for no termination
19	Button Cover Plate Mounting Screws	2 screws that hold the button cover plate to the body of the device. Remove to access the buttons (see Figure 6)

4 Connecting the RC-76R/RC-78R

Always switch off the power to each device before connecting it to your **RC-76R/RC-78R**. After connecting your **RC-76R/RC-78R**, connect its power and then switch on the power to each device.

To connect the **RC-76R/RC-78R** as illustrated in the example in Figure 2:

1. Connect the IR outputs as follows:
   - Connect an IR emitter to IR OUTPUT 1 and attach the emitter to the DVD player 1
   - Connect an IR emitter to IR OUTPUT 2 and attach the emitter to the DVD player 2
2. Connect the RS-232 ports (see Section 4.1) as follows:
   - Connect RS-232 port 1 to the projector
   - Connect RS-232 port 2 to the plasma display
3. Connect the RELAY terminal block connectors as follows:
   - Connect RELAY C and 1 to the screen
   - Connect RELAY C and 2 to the lighting system
4. Connect the GPI/O 1 port to a motion detector.
5. Connect the Ethernet port to a network.

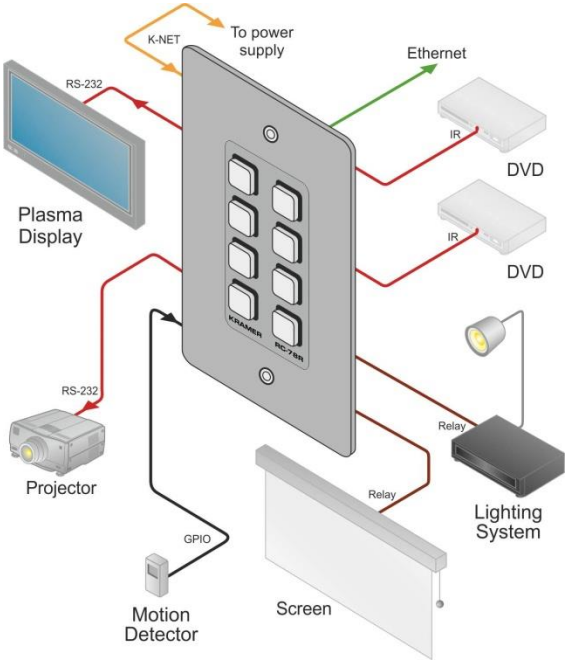


Figure 2: Connecting the RC-76R/RC-78R Room Controllers

4.1 Connecting RS-232 Devices

You can control up to two AV devices such as a projector or an RS-232 display by connecting them to the **RC-76R/RC-78R** via their RS-232 connection.

To connect a device to the **RC-76R/RC-78R** via RS-232:

- Using a straight cable, connect pin 2 to **TX**, pin 3 to **RX** and pin 5 to **GND** on the RS-232 terminal block connector of the **RC-76R/RC-78R**

4.2 Connecting RS-485 Devices

You can control up to one AV device by connecting it to the **RC-76R/RC-78R** via its RS-485 connection.

To connect a device to the **RC-76R/RC-78R** via RS-485:

- Connect the A (+) pin of the device to the **A** pin on the RS-485 terminal block of the **RC-76R/RC-78R**
- Connect the B (-) pin of the device to the **B** pin on the RS-485 terminal block of the **RC-76R/RC-78R**
- Connect the G pin of the device to the **GND** pin on the RS-485 terminal block of the **RC-76R/RC-78R**

If your device is the first or last device on the line, slide the RS-485 termination switch up otherwise make sure it is set to down (see Figure 1).

4.3 Connecting the Ethernet Port

The Ethernet connection of the **RC-76R/RC-78R** lets you perform all control functions of the **RC-76R/RC-78R** over the Internet using a PC running the Kramer Site-CTRL control program to control AV devices.

To connect the **RC-76R/RC-78R** to a network:

1. Connect the Ethernet port of the **RC-76R/RC-78R** to the Ethernet port on a network hub or network router, via a straight cable with RJ-45 connectors.
2. At the other end, connect the Internet to a PC running **Site-CTRL**.
3. After connecting the Ethernet port, you have to install and configure it. For detailed instructions on how to install and configure your Ethernet port, see the *K-Config Software Guide.*
   Available from our Web site at http://www.kramerelectronics.com.

4.4 Connecting the K-NET Port

The K-NET port is wired as shown in Figure 3.

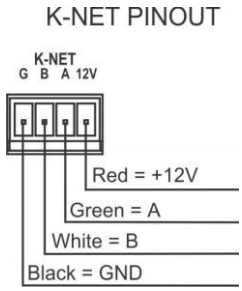


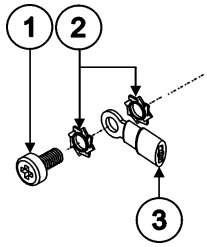
Figure 3: K-NET PINOUT Connection

If your device is the first or last device on the line, slide the K-Net termination switch up otherwise make sure it is set to down (see Figure 1).

4.5 Grounding the RC-76R/RC-78R

The grounding screw is used to earth the chassis of the unit to the building ground preventing static electricity from impacting the performance of the unit.

Figure 4 defines the grounding screw components.



#	Component Description
1	M3X6 screw
2	1/8" Toothed Lock Washer
3	M3 Ring Tongue Terminal

Figure 4: Grounding Connection Components

To ground the **RC-76R/RC-78R**:

1. Connect the ring tongue terminal to the building grounding point wire (a green-yellow, AWG#18 (0.82mm^2) wire, crimped with a proper hand-tool is recommended).

2. Insert the M3x6 screw through the toothed lock washers and the tongue terminal in the order shown above.

3. Insert the M3x6 screw (with the two toothed lock washers and ring tongue terminal) into the grounding screw hole and tighten the screw.

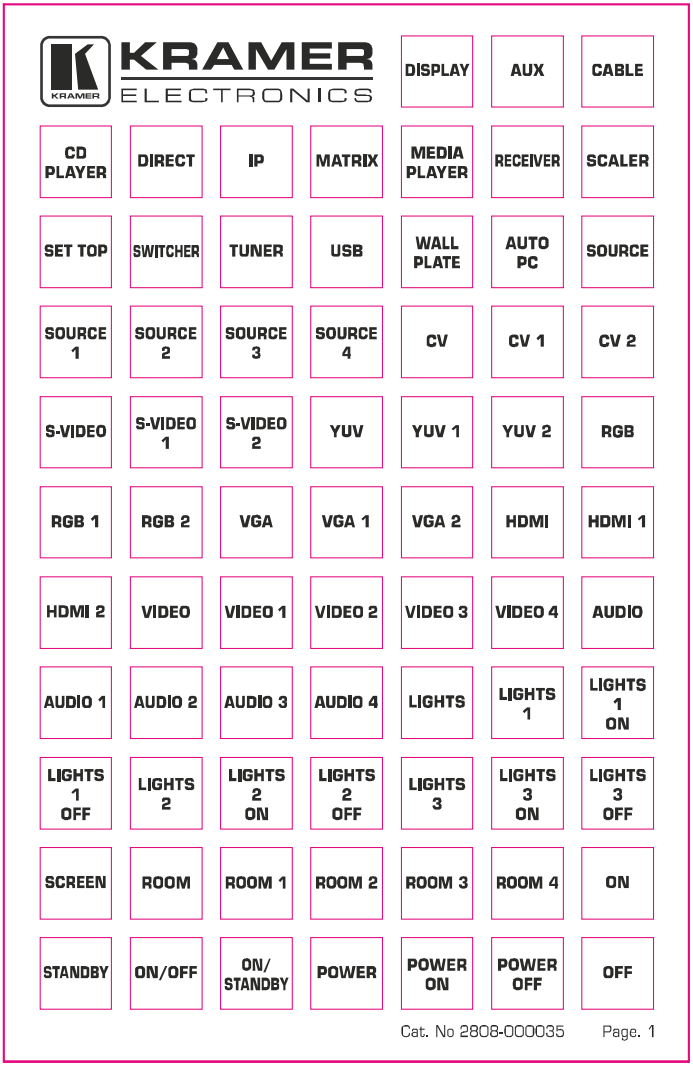
5 Operating the RC-76R/RC-78R

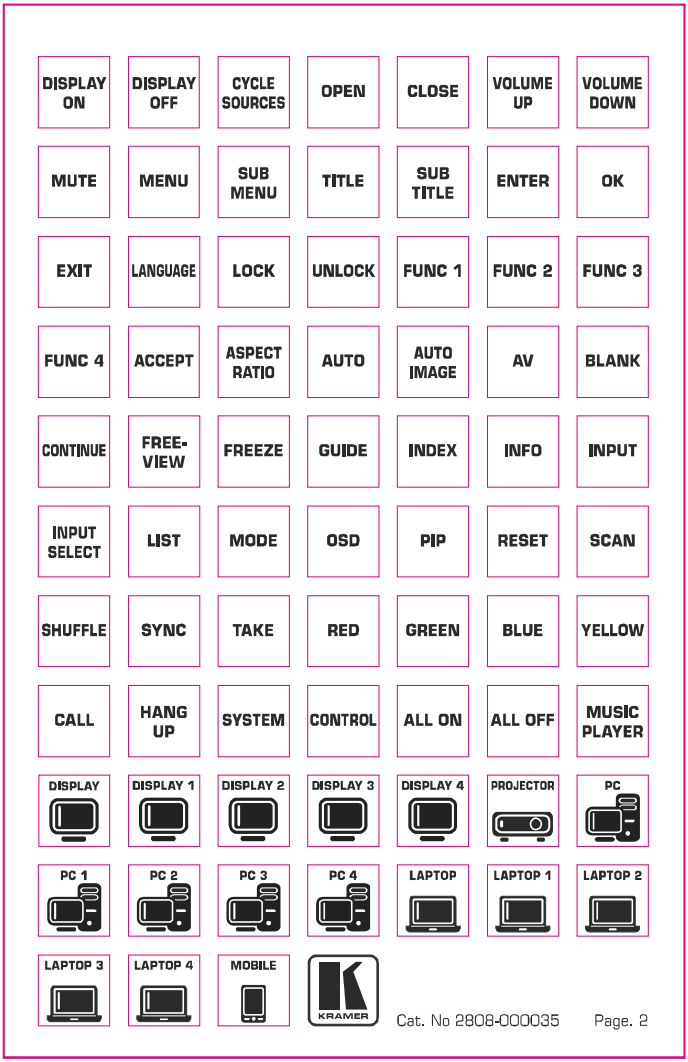
You can operate your **RC-76R/RC-78R** using:

- Front panel buttons. These are configured using the **K-Config** software. For instructions on using the software, see the *K-Config Software Guide* available from our Web site www.kramerelectronics.com
- A PC running **Site-CTRL** control software:
  To operate your device using **Site-CTRL**, see the *Site-CTRL User Guide* available at the Kramer Web site
- The built-in Web server. For more information, see the K-Config User Guide

6 Front Panel Button Caps and Labels

The **RC-76R/RC-78R** are supplied with a button label sheet and 6/8 clear, button caps to house the labels. Figure 5 illustrates a sample button label sheet.




DISPLAY ON
DISPLAY OFF
CYCLE SOURCES
OPEN
CLOSE
VOLUME UP
VOLUME DOWN
MUTE
MENU
SUB MENU
TITLE
SUB TITLE
ENTER
OK
EXIT
LANGUAGE
LOCK
UNLOCK
FUNC 1
FUNC 2
FUNC 3
FUNC 4
ACCEPT
ASPECT RATIO
AUTO
AUTO IMAGE
AV
BLANK
CONTINUE
FREE-VIEW
FREEZE
GUIDE
INDEX
INFO
INPUT
INPUT SELECT
LIST
MODE
OSD
PIP
RESET
SCAN
SHUFFLE
SYNC
TAKE
RED
GREEN
BLUE
YELLOW
CALL
HANG UP
SYSTEM
CONTROL
ALL ON
ALL OFF
MUSIC PLAYER
DISPLAY
DISPLAY 1
DISPLAY 2
DISPLAY 3
DISPLAY 4
PROJECTOR
PC
PC 1
PC 2
PC 3
PC 4
LAPTOP
LAPTOP 1
LAPTOP 2
LAPTOP 3
LAPTOP 4
MOBILE
KRAMER
Cat. No 2808-000035
Page. 2

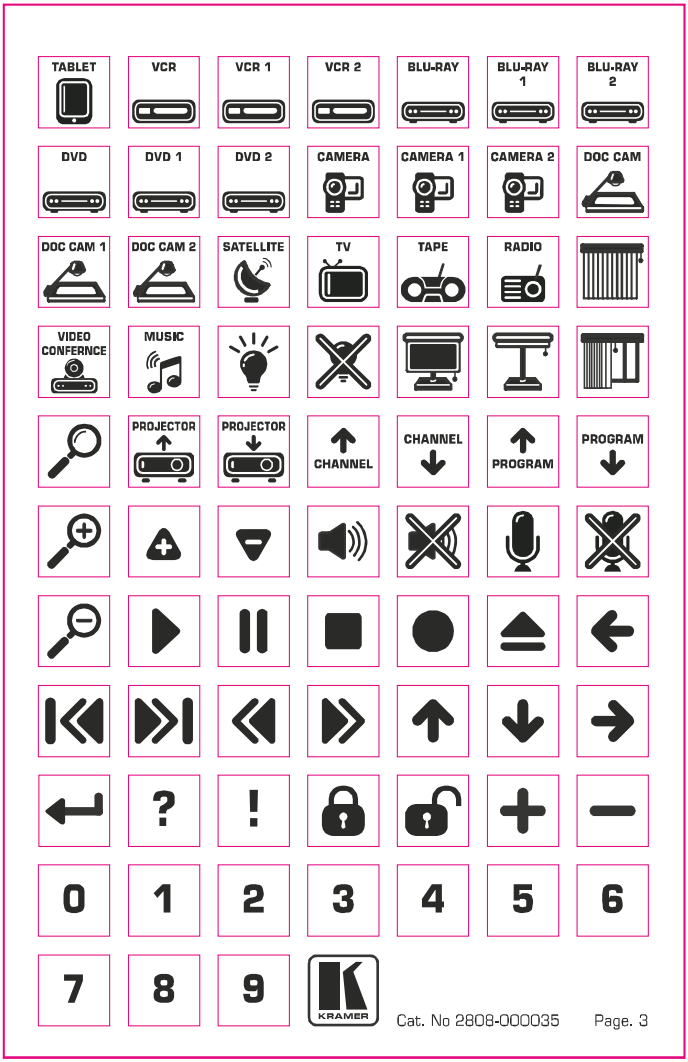


Figure 5: Sample Button Label Sheet

6.1 Installing the Front Panel Button Caps and Labels

To install the button caps and labels:

1. Remove the required labels from the supplied button label sheet.
2. Unscrew the Decora front plate from the device. Put the plate and screws aside.
3. To access the buttons, remove the two button cover plate mounting screws (see Figure 6) and remove the button cover plate. Put the plate and screws aside.

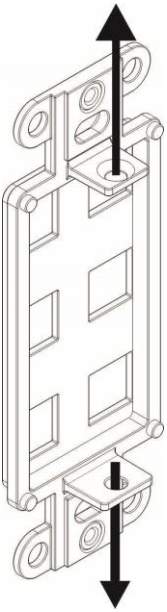


Figure 6: Removing the Button Cover Plate Mounting Screws

4. Lift each cap away from its button.
5. Holding the button cap with the “wings” on the top and bottom as shown in Figure 7, insert the label inside the cap.

Figure 7: Button Cap Orientation with Label

6. Retaining the orientation, return each cap to its correct button.

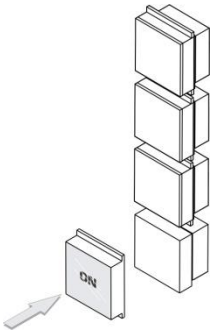


Figure 8: Replacing the Button Cap

7. Repeat for all caps.

8. Replace the button cover plate and screw it into place with its mounting screws.

9. Replace the Decora face plate over the unit and screw it into place with its mounting screws.

7 Technical Specifications

INPUTS:	2 RS-232, 1 RS-485, 1 GPI/O and 1 K-NET on terminal block connectors; 1 Ethernet on an RJ-45 connector; 1 USB for programming
OUTPUTS:	2 IR, 2 relays (36V AC or DC, 2A, 60VAC maximum on non-inductive load) and 1 GPI/O on terminal block connectors
DEFAULT IP SETTINGS:	IP number – 192.168.1.39; Mask – 255.255.0.0; Gateway – 0.0.0.0
POWER CONSUMPTION:	12V DC, 260mA
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	7.9cm x 2.8cm x 12.4cm (3.1" x 1.1" x 4.9") W, D, H (with wall plate)
WEIGHT:	0.6kg (1.4lbs) approx.
ACCESSORIES:	Power supply, black and white front plates, black and white Decora frames
Specifications are subject to change without notice at http://www.kramerelectronics.com	

LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

Exclusive Remedy

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPICABLE LAW.

IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, please visit our Web site at www.kramerelectronics.com or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.

For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com

SAFETY WARNING
Disconnect the unit from the power supply before opening and servicing

P/N: 2900-300253 Rev: 2